

**Environmental Public Health Tracking: Western Montana Pilot Project**  
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**ABSTRACT**

*Background:* Western Montana provides a unique opportunity to explore environmental public health tracking data linkages in small communities. The coverage area for existing ambient air pollution monitoring stations is limited by the mountainous terrain. However, communities in these areas are subject to high variations in ambient PM concentrations due to periods of winter inversions and smoke from occasional summer wildfires.

*Objective:* This pilot study was designed to assess the feasibility of collecting electronically-available health outcome data in three small communities and to explore retrospective PM and hospital data for asthma and cardiovascular conditions with a particular focus on variability in PM exposures due to wildfire events or cold temperature inversions.

*Methods:* PM<sub>2.5</sub> data, sampled every third or sixth day, were collected from five air monitoring stations for a four-year period. Hospital visits for respiratory, cardiovascular, cerebrovascular, and digestive conditions were collected from five hospitals servicing the three study areas. Poisson regression models were used to evaluate the association between three-day average PM<sub>2.5</sub> concentrations and daily counts of hospital visits for specified conditions.

*Results:* These analyses are currently undergoing peer review, but preliminary results are presented here. Average annual PM<sub>2.5</sub> concentrations for the study areas ranged from 9.6 µg/m<sup>3</sup> to 16.1 µg/m<sup>3</sup> with peak exposures occurring during two prolonged wildfire episodes and intermediate exposures occurring during cold temperature inversions. During wildfire episodes of 2000 and 2003, hospital visits in Missoula for asthma increased by 38% compared to the corresponding calendar days in 2001 and 2003 while there were slightly few hospital visits for other respiratory and cardiovascular conditions. For the four-year period, a 10 µg/m<sup>3</sup> increase in three-day moving average PM<sub>2.5</sub> concentrations were associated with a 5.5% increase in hospital visits for asthma (95% confidence interval (CI): 3.0 – 7.4%).

*Conclusion:* These data suggest a promising potential for future efforts at collection of existing health data in western Montana and, potentially, other regions of the state. The topographical and meteorological features of these study areas and the potential for exposures from wildfires and periods of cold temperature inversions allow for unique opportunities to study variable PM exposures in rural communities. Future data collection efforts should focus on additional study areas, health data from non-hospital outpatient sources, and multi-pollutant environmental data.

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